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JUL 31 1934

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



JULY 28, 1934

**Finds Monsters of Long Ago**

See Page 51

A

SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

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Summary of Science

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## DO YOU KNOW?

By 1976 England's population of 38 million is expected to decrease to 33 million.

The world's most northerly port is being constructed in Siberia at the mouth of the Lena River.

Tarnish can be cleaned from copper and brass by using buttermilk, says Cornell University's home economics department.

Philadelphia's Symphony Orchestra is now equipped with aluminum chairs, which are light and durable and noiseless during the playing.

Thirty Danish pigs, each with a carefully kept family history, have been imported for comparison with the best breeds of American pigs.

There is no truth in the old rumor that cucumbers contain a poisonous juice, and the supposed remedy—soaking them in salt water—merely wilts and toughens the cucumbers.

Of the 92 known chemical elements 17 have not yet been found in the free state.

The new Everglades National Park will be about twice the size of the state of Rhode Island.

A botanist of the University of Cincinnati, Dr. Lucy Braun, is pioneering in studies of forest conditions in southeastern Kentucky.

As long ago as 1868, Westminster, England, tried out a red and green traffic signal in the form of a gas lamp and used only at night.

A pair of bald-headed eagles are reported to have made their nest in the abandoned lighthouse tower in Cocksport Island, in the Savannah River.

The government warns farmers that poisonous plants are a special hazard for livestock in the drought area this year, for hungry cattle will eat even unpalatable food.

## WITH THE SCIENCES THIS WEEK

## ARCHAEOLOGY

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## ASTRONOMY

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Can steel wool be used on a telescope mirror without great harm to the surface? p. 63.

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## GENERAL SCIENCE

How many German university students have been compelled to quit their studies? p. 57.

## MEDICINE

Is cancer infectious? p. 53.

Is heredity alone responsible for development of diabetes? p. 55. *Diabetes*—Benjamin F. Smith—Appleton, 1930, \$2.

What change in the blood occurs before death? p. 62. *The Clinical Interpretation of Blood Examinations*—Robert A. Kilduffe—Lea & Febiger, 1931, \$6.50.

What is the function of the parathyroid glands? p. 58. *Recent Advances in Endocrinology*—A. T. Cameron—Blakiston's, 1934, \$3.50.

What new remedy is being made for chronic infectious arthritis? p. 61.

## PALEONTOLOGY

What makes the assembling and restoring of fossil bones difficult? p. 51. *Vertebrate Paleontology*—Alfred S. Romer—Univ. of Chicago, 1933, \$5.

What rare footprint was found on U. S. Highway 111? p. 57.

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Do bears shed tears? p. 56.

Was the dragon always brave? p. 61.

Why do whales never rest on the surface of the water? p. 56.

*These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the article, but the references for further reading. Books cited can be supplied at Book Department, Science News Letter, at publisher's prices, postpaid in the United States.*

PALEONTOLOGY

# Twelve Swamp Dinosaurs Found by Museum Party

Well Preserved Fossil Bones When Assembled Will Probably Form Creatures 25 to 40 Feet Long

**T**WELVE gigantic prehistoric animals, dinosaurs that roamed lakes and swamps of 125,000,000 years ago, have been discovered by Dr. Barnum Brown, curator of fossil reptiles of the American Museum of Natural History, New York, some 25 miles east of Greybull, Wyo., in the foothills of the Big Horn Mountains.

Enough bones have been uncovered to cause Dr. Brown to feel that "we have stumbled upon one of the greatest fossil mines in the paleontological history of America."

At present the dinosaur remains are simply a large pile of loose bones, but when assembled eventually as museum exhibits their skeletons will probably show that the sauropod dinosaurs, believed to belong to a hitherto unknown species, ranged in size from 25 to 40 feet in length and from 10 to 14 feet in height. They were salamander-like creatures.

Dr. Brown as head of the American Museum-Sinclair dinosaur expedition, has been excavating in the vicinity of Keyhole Canyon since the early part of June and these excavations are now producing dramatic and surprising results. For Dr. Brown had expected to find only two sauropods instead of twelve.

## Reconstruction Easy

"To date we have uncovered enough bones spread over a seventy by sixty foot site," stated Dr. Brown, "to feel satisfied that we have at least twelve sauropod remains before us. Others may be buried under this layer of bone or near it. The bones are not articulated, hardly even associated, but they are so unusually well preserved that the task of reconstructing them will be quite easy. For one thing, they are entirely free from the iron and crystal deposits which frequently make the matter of cleaning and restoring fossil bones a herculean and almost impossible task.

"While I have nothing definite to base this statement on, I somehow feel that we have only scratched the surface yet and that we have stumbled upon

one of the greatest fossil mines in the paleontological history of America.

"We have at least 50,000 pounds of fossil bones in sight and one of the things that worries us is to preserve them from the elements long enough to get them out of the ground and carted to Greybull which includes a ten-mile journey over narrow and rough mountain trails."

*Science News Letter, July 28, 1934*

PALEONTOLOGY

## How Dinosaurs Died 125,000,000 Years Ago

By Dr. BARNUM BROWN, Curator of Fossil Reptiles of the American Museum of Natural History and Leader of the American Museum-Sinclair Dinosaur Expedition.

**O**UR discovery will unearth data that will throw light upon hitherto unexplored recesses of the prehistoric past.

One interesting feature is that the

position of the bones, as well as the clay and sandstone which cover and surround them, gives a graphic account of how these huge creatures met death. The account of the tragedy that wiped them out appears as plainly as a printed obituary because it has been preserved in the sands on which it was staged in those long-gone days when the north-west was flat, swampy and almost at sea level.

But before we reconstruct the tragedy that took place in prehistoric Wyoming 125,000,000 years ago, we must first of all set the stage upon which the drama was enacted.

We see a flat land, rich in vegetation and dotted by countless shallow lakes, swamps and rivers. The climate is tropical. Pines, cycads, figs and bananas cover the uplands. Thick grass grows along the banks and rank vegetation thrives in the water.

We know those stage properties were there for remnants of them have been found in various sections of the Big Horn Range. Further evidence has been discovered in the Red Gulch Quarry where, in the earth immediately over the bones, we have discovered carbonized fragments of the rushes, grass and other plants on which the sauropods—amphibious and herbivorous dinosaurs—fed in their day.

Now the actors come upon the stage. Huge slab-sided creatures that weigh from 15 to 20 tons apiece and measure nearly 50 feet. They have whip-like



## RICHEST FOSSIL MINE

*This paleontological treasure heap of bones which belonged to monsters that roamed the land in Wyoming millions of years ago was unearthed by Dr. Barnum Brown, of the American Museum of Natural History. Remains of eight huge sauropod dinosaurs believed to belong to a hitherto unknown species were found.*

tails and long necks at the ends of which sit ridiculously small heads. They float, swim and feed in the waters with unhurried languor, for they are sluggish, cold-blooded creatures. They enter by the tens of thousands, huddling close together as reptiles do, and filling every lagoon as far as the eye can see. Myriads of them cluster the watery landscape like city-throngs crowding a popular beach during a heat-wave.

#### A Great Change

Now Mother Nature slowly changes the stage setting. The lakes dry up and the swamps vanish. The sauropod dinosaurs become more and more concentrated as they are pushed together in huge herds by the drying up process which changes lakes into ponds, ponds into pools and lastly into quickly drying puddles. The sauropod dinosaurs are water animals and the disappearance of the water is their death sentence. They cannot migrate because of their great bulk. Some starve to death—others are stranded in the mire that follows the receding water—while others, in their frenzied rush to escape destruction, struggle to solid land, only to be killed by the flesh-eating monsters that skulk around the pools and live high, for a time, on the hapless sauropods.

A clear-cut cross section of this large scale drama is now being uncovered in the Red Gulch Quarry. The hill in which the skeletons rest was once upon a time the bottom of a large lake that shrank into a tiny pond. It is perfectly evident that it is the bottom of that pond we have stumbled upon—the very spot where a dozen or more sauropods made their last and futile stand against fate—one of the last remnants of hundreds, perhaps thousands, of these beasts that lived and thrived in that very spot until the lake began to dry up and the relentless battle started in which the weak were swiftly killed while the strong survived for only a short time.

#### May Find Victors, Too

We have not found any as yet, but I would not be at all surprised if, dove-tailed in among the sauropod bones, we should find remains of the carnivorous dinosaurs that, undoubtedly, came to the lake to feed on the sauropods and eventually died of starvation when their victims sank into the bog.

*Science News Letter, July 28, 1934*

Pieces of fossil wood found 200 feet underground near Placerville, Calif., have been identified as trees of the Miocene epoch, 11,000,000 years ago.

PHYSICS

## Old Violin Makers' Secrets Revealed by X-Ray Analysis

Treatment and Varnish Are Not So Important As Is Selection of Wood for Back, It is Found By Physicists

**T**HE SECRET of the tone of violins fashioned by such famous makers as Stradivarius, Amati, Pique and others, has been discovered.

Through X-ray studies of structure of wood in violins of various origins, Dr. K. Lark-Horovitz and W. I. Caldwell, physicists of Purdue University at Lafayette, Ind., have found that proper selection of wood is more important for the quality of the instrument than treatment and varnish.

By careful selection of wood as a result of the Purdue researches it will be possible, it is believed, to make modern violins that are the equal in tone to those by famous makers.

The results of the Purdue researches were communicated to and published by the British scientific journal, *Nature*.

Definite fiber structure was found in spruce wood used for the top of violins, but the pattern of molecules revealed by the X-rays when they were turned on the wood used for the back showed that the woods, mostly maple, are different for instruments of different tone quality. Instruments with an even and smooth tone quality, especially for higher pitch or E-string, show an almost complete lack of orientation in the wood used for the backs.

#### Makes Tone Harsh

Violins with a harsh tone quality in general, weak response and shrill upper register showed a marked fiber structure in the maple used in the construction of their backs.

"Our investigation indicates," the Purdue scientists concluded, "that for a fine instrument only the top should be characterized by different velocity of sound in different directions, whereas the velocity of sound in the back should be the same in all directions so as to produce the best results."

Not since the French investigations of Savart over a century ago had there been adequate inquiry into the choice of material for violins. It had been stated repeatedly that age, treatment and varnish change the character of the

wood, but the studies of Dr. Lark-Horovitz and Mr. Caldwell indicate that this is not the case.

Modern makers of fine violins by using X-ray analysis of woods and following the construction methods revealed by the new studies are expected to produce modern instruments that rival in usefulness the old violins valued at many thousands of dollars.

*Science News Letter, July 28, 1934*

ENGINEERING

## Don't Buy "Gas Savers" Warns Bureau of Standards

**D**ON'T BUY "gas savers," "grease absorbers," or "burner protectors." They don't save a penny; in fact, they usually cost more by increasing gas bills and many of them causes headaches, or worse effects of that stealthy and dangerous poison, carbon monoxide.

The National Bureau of Standards has conducted an investigation of a number of gadgets and appliances that were sold over the doorsill by salesmen who lauded them to the skies in extravagant claims of their value. The results of this research called for a warning against such purchases, which the Bureau issued.

All of the "gas savers," it stated, affected the operation of a satisfactory gas range in such a way as to increase the tendency to form carbon monoxide, which even in very small amounts is injurious to health. Although agents sometimes boasted of a reduction in gas bills as high as 30 per cent., none of the attachments tested appreciably increased efficiency while some of them considerably increased the amount of gas needed for certain purposes.

#### Lower Efficiency

The "burner protectors," the report continued, keep the burners clean but do so at the expense of cooking efficiency. None of the water backs tested proved satisfactory while some of them caused the formation of carbon monox-

ide. Attractive solid tops and all the varied things which are placed in the flues tended to prevent complete combustion and to lower efficiency and were an actual menace to health. A flue is constructed by the manufacturer to be as small as possible and still allow complete burning of the gas, and when it is obstructed further to keep more heat in the stove or for any other purpose, a

dangerous condition frequently results.

"The 'grease absorbers,'" scientists observe, "should be called grease diffusers, because they merely distribute the grease more uniformly around the kitchen. Those that are filled with steel wool or other material in such a way as to obstruct the passage of the flue gases may become dangerous."

*Science News Letter, July 28, 1934*

#### MEDICINE

## Cancer Caused By Virus Present in Even Normal Cells

### New Theory of British Scientist Holds Disease Is Not Infectious But Develops From Irritation

**W**ITHIN seemingly normal cells of human bodies, there is always a virus capable of causing cancer. Whether or not the disease develops depends upon whether a physiological "trigger" in the form of mechanical or chemical irritation sets free the virus.

This new theory of cancer with evidence for its support is presented by Dr. C. H. Andrewes of Britain's Medical Research Council.

Dr. Andrewes' report to the Royal College of Surgeons appearing in the *Lancet* is commended by the editor of the *Lancet* as "by far the most comprehensive survey" of the subject yet presented.

When irritants initiate malignancy, Dr. Andrewes believes, no virus enters the body. It has always been there, dormant, pending the trigger mechanism which sets off the malignant process. Such mechanical balance would explain the graduations from benignancy to extreme malignancy which are seen in tumors.

#### Like Fever Blisters

The development of cancer is seen as somewhat analogous to the formation of fever blisters. A mere rise in body temperature, such as caused by a fever, is enough to cause fever blisters in about every other person so afflicted. The herpes simplex virus seems to be liberated by the heat and causes the face eruption.

Dr. Andrewes' theory, according to the editorial, confirms the fact that cancer is not infectious in the conventional sense. In other words, although caused

by a filtrable virus it is not infectious like infantile paralysis, for example, which is also caused by a filtrable virus.

Many cancer students have thought that mammalian cancers are an apparently different class of tumors from the filtrable fowl tumors, but Dr. Andrewes

does not agree. He thinks the two kinds are really alike. The only way in which filtrable tumors of birds differ from cancers of men and other mammals lies in the fact that the causative agent of the fowl tumors can be demonstrated apart from the cells it normally inhabits, he concluded from his investigations.

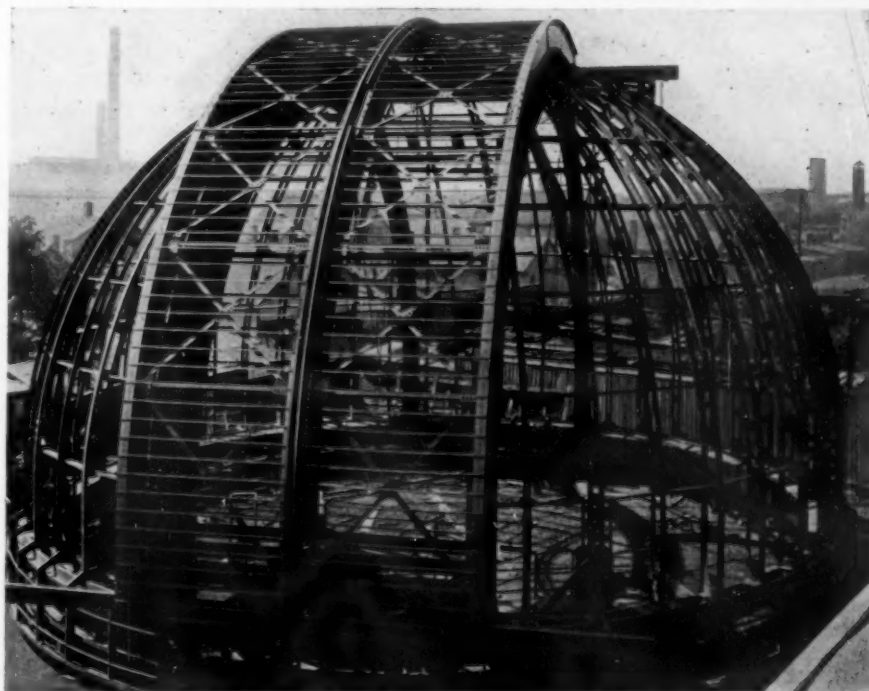
The causative agents of cancer have properties so like those of the known viruses that excluding them from the virus group is unjustified, in Dr. Andrewes' opinion.

The natural history of other viruses readily explains the production of tumor growth phenomena, he stated. Many viruses multiply within the cells of the body and once they have gotten into these cells they cannot be neutralized by external antibodies.

*Science News Letter, July 28, 1934*

Glass cotton, glass silk, and glass wool are novel fibers which have a variety of industrial possibilities.

Rosie, a Yellowstone Park bear, emerged from hibernation this spring with four black cubs, the biggest family of bears ever credited to one mother.



#### TO CATCH THE STARLIGHT

This giant "mousetrap" is really the framework of a new observatory dome to house the large telescope which will be located on the summit of Mt. Locke, in southwestern Texas. Arc-welded steel bracing will protect the structure against possible earthquake shocks. It is shown here as it was pre-assembled in Cleveland, Ohio, before its 1500-mile journey to Texas. The dome, which is 62 feet in diameter and 73 feet high, was constructed by the Paterson-Leitch Company under the supervision of the Warner and Swasey Company, designers. An electrically-moved observing bridge will give the observers access to all parts of the dome and the telescope it encloses.

## CHEMISTRY

## Chemists Now Puzzled By Two Kinds of Element No. 93

**A** MERICAN scientists are wondering if famous element 93, which the Italian physicist Enrico Fermi created artificially with much labor recently, may not have existed undiscovered on the earth all the time.

Support of such suspicions comes from Yugoslavia where Dr. O. Koblic reports the discovery of a new element christened bohemia, which is heavier than uranium, having such an arrangement of atom parts that it, too, may be called element 93. Dr. Koblic has something more than a transitory element like that of Dr. Fermi, for he has a tiny speck of yellow powder which consists of silver combined with the new bohemia.

Thus, at present, two elements 93 have been found; the Italian variety breaking up to half the original amount in 12 minutes, the Yugoslavian kind seemingly an inert, permanent substance.

The two kinds can hardly be the same thing.

Dr. Koblic's bohemia is apparently named after Bohemia just as Madame Curie named the element polonium after her native Poland.

Bohemia was extracted from the substance pitchblende which also yields many other radioactive compounds like polonium and radium. The new element is said to be present in relatively high concentrations of one per cent.

How the presence of bohemia has been overlooked for the last thirty years is a mystery. In that time many of the best scientific minds of the world have investigated pitchblende for everything it contains. Chemical methods detect substances in much less than the reported one per cent. concentration.

The present answer to the mystery would seem to be that bohemia is an inert element which does not blow itself apart rapidly enough to make its presence known as do all the rest of the heavier elements that disintegrate by radioactivity.

Scientists may have plenty of work deciding how the two kinds of element 93 come about and their relation to one another. At present one might be likened in the way it acts to an active, bouncing baby; the other to a sedentary, elderly grandmother.

*Science News Letter, July 28, 1934*

## SEISMOLOGY

## Greatest Concentration of Earthquakes For Years

**A** BARRAGE of earthquakes shook various parts of the world during the last five days of the week ending July 21 and seismologists pronounced the earth more unquiet than it has been in several years.

The telegraphic collecting system for seismological information operated by Science Service in cooperation with the U. S. Coast and Geodetic Survey, the Jesuit Seismological Association and some 30 seismological observatories throughout the world showed that there were at least 17 earthquakes during the five-day period strong enough to jiggle recording instruments far distant from their origins. At least three of these were world-shaking earth movements.

The Panama-Costa Rica border and the New Hebrides region of the South Pacific were the two important centers of the quakes, although there may have been activity centered at other locations.

### Off Mexico

The earthquake that was recorded on seismographs of the North American continent on Monday (July 16) has been located as centered on the west coast of Mexico in the state of Guerrero. It was comparatively weak.

The Jesuit Seismological Association central station at St. Louis determined the epicenter, using seismological station reports collected by telegraph from the Tucson, Ariz., station of the U. S. Coast

and Geodetic Survey, Georgetown University and Fordham University.

The latitude and longitude of the epicenter was determined as 16.9 degrees north and 100.1 degrees west, and the time was 3:19 a. m. E.S.T.

### Tuesday's Felt at Sea

A severe earthquake was felt by ships at sea off the coast of Central America Tuesday night, July 17.

The center of the disturbance was located by the U. S. Coast and Geodetic Survey from seismological reports collected by Science Service as being near Panama. The epicenter was calculated to be 8 degrees north latitude and 83 degrees west longitude, and the exact time was 8:36.4 p. m., eastern standard time.

The shock of the quake was felt distinctly on two ships at sea, reports to the Hydrographic Office of the Navy indicated. Those on board the *S. S. Tuscaloosa City* about 6½ miles southwest of Montuosa Island, which is off the coast of Panama in the Pacific Ocean, felt the shock for a full 20 seconds. Reports from the *S. S. Point Sur*, 11 miles southwest of Bruica Island, indicated that the shock was felt severely on board for ten seconds.

### Great Activity

Extraordinary seismological activity on the following day was dominated by one rather strong earthquake originating near the New Hebrides island in the Pacific and another which was an aftershock of Tuesday's Gulf of Dulce quake.

At least nine different shocks were recorded on seismographs Wednesday and early Thursday with such quick succession that the trembling of one had hardly ceased writing its lines on the seismological record before another quake started.

The Panama after-shock occurred a tenth of a second after noon, E.S.T., while the shock centered near the New Hebrides occurred at 2:40 p. m. E.S.T.

Three of the series of shocks that were felt in Panama were sufficiently severe to set in motion the special strong motion seismographs that have been installed by the U. S. Coast and Geodetic Survey at Balboa Heights. These machines start recording only when the earth moves sufficiently to make a local record worthwhile. These special seismographs were originally designed for investigating California earthquakes.

*Science News Letter, July 28, 1934*

## MEDICINE

# Diabetes Is Inheritable Disease

## Studies of Twins Shows

Rate of Incidence Among Children of Parents Having Diabetes Indicates It is Mendelian Recessive Trait

**T**WINS are helping to prove that diabetes or a tendency to it is inherited.

This theory has been held by physicians since 1696. But it is the occurrence of the disease in over a score of twins and the painstaking scientific study of hundreds of diabetic families that is proving hereditary tendency of diabetes to be a fact rather than a theory.

New evidence in support of this idea appears in two instances of diabetes occurring in identical twins, reported in the same week by physicians in Boston and Canada.

The cases reported from Canada occurred in twin brothers over fifty years of age. They are identical twins and resemble one another in appearance, interests, habits and behavior, according to the description given by Dr. E. M. Watson of the University of Western Ontario, London, Ont., in his report to the *Canadian Medical Association Journal*. When diabetes was discovered in the first twin, a test was made for the disease in his brother. This twin did not have any symptoms of the disease, and was apparently perfectly well, but the test showed that he was not utilizing carbohydrates properly and was excreting large amounts of sugar instead of burning it up in his body. An antidiabetic diet was prescribed but he paid little attention to it and three years later he also developed the other symptoms of diabetes.

In Boston a five-year-old girl was brought into the New England Deaconess Hospital in diabetic coma. Physicians in charge, Drs. Priscilla White, Elliot P. Joslin and Gregory Pincus, ventured a prediction that her identical twin sister, then apparently well, would develop the disease within a decade. Three years later she did, the Boston physicians now report to the *Journal of the American Medical Association*.

Dr. Watson points out that an inherited tendency to the disease may not be sufficient to account for the develop-

ment of active diabetes without the aid of contributing influences. But environment is not the principal cause of diabetes in twins. Fraternal twins, developing from separate egg cells, occur three times as often as identical twins which have developed from the same egg cell. However, the majority of twin diabetics are identical twins. Both twins of each set therefore have an identical hereditary background.

The Boston investigators have worked out the way in which diabetes might be expected to occur in children of two diabetic parents; of one diabetic parent and one parent carrying the hereditary tendency to diabetes without developing the disease; and of both parents carriers. Considering tendency to diabetes as a Mendelian recessive characteristic, they would expect the disease to occur in children of the three groups of parents (carrier x carrier, carrier x diabetic, diabetic x diabetic) in the ratio of 1 to 2.5 to 6.1. A study of over 800 families gave the actual ratio of 1 to 2.4 to 5.7.

This significant fact and the concurrence of diabetes in identical twins gives validity to the theories that the disease is inherited and that it is transmitted from parent to child according to the Mendelian laws of inheritance, the Boston investigators conclude.

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## ECOLOGY

## Tough Plants Defy Death In Unique Gypsum Desert

**D**ROUGHT and heat that would seem "fit to kill a horned toad" mean nothing to a few species of extra-tough plants, that grow in a unique desert composed of drifting dunes of pure gypsum crystals.

Two hundred seventy square miles of these drifting gypsum crystals constitute the area known as the White Sands of southern New Mexico. These dunes are so white that it is almost impossible to avoid the impression that



### IN SHIFTING SANDS

*Only a few plants can grow fast enough to keep from being buried by these drifting white sands of gypsum. And only a few are hardy enough to survive when the sands recede again, leaving roots exposed to the terrific glare of desert sun. The yucca pictured here is one of these rare desert-adapted plants.*

they are fifty-foot snow drifts. This illusion tends to weaken, however, when the thermometer registers 100 in the shade that isn't there. Studies of the adjustments to these conditions are being carried on by Prof. Fred W. Emerson of New Mexico Normal University.

The gray or brownish dunes of impure quartz sand found in arid lands and along the shores of lakes or seas make hard conditions for the growth of plants, but these drifting piles of gypsum sand add new difficulties to plant life. Chemical tests show that there is not more than perhaps 2 per cent. of impurities in the gypsum, thus introducing difficulties in absorbing sufficient amounts of nitrates and other essential soil nutrients.

As in all drifting sand, there are only a few species of plants that are able to grow upward fast enough to keep from being covered by the advancing dunes. In the White Sands there are only six species that commonly succeed in the moving sand. They are a cottonwood, rabbit brush, aromatic sumac, a shrubby pennyroyal, a yucca and that peculiar gymnosperm, Ephedra.

Some of the individuals of species that usually grow to be only shoulder high under ordinary conditions grow forty or fifty feet upward through the dunes.

*Science News Letter, July 28, 1934*

## ENGINEERING

**World's Largest Power Equipment Taking Shape**

**B**ECAUSE of the size of the 1,850,000 horsepower Boulder Dam power project, its generators and equipment are the largest and most powerful ever built.

Already taking form at the Schenectady plant of the General Electric Company are the first two of the seventeen power units to be installed eventually. Each is capable of producing 110,800 horsepower, and each exceeds in size and capacity any similar machine now in operation.

Other large generators include Soviet 104,000 horsepower and Niagara Falls 82,000 horsepower units.

When all 17 generators are installed in the power house below the dam, the muddy waters of the Colorado River will be converting a total of nearly 2,000,000 horsepower into electricity.

Since the total developed water power in the United States in 1933 was estimated at 15,817,941 horsepower by the U. S. Geological Survey, Boulder Dam will be turning out an equivalent of about 12 per cent. of the power now manufactured by 3,337 different electric plants.

*Science News Letter, July 28, 1934*

## RADIO

**Radio Picks Out Selected Programs; Acts As Alarm**

**D**EVELOPMENT of a robot radio which tunes on and off different stations was announced recently by A. Atwater Kent, radio engineer and manufacturer. The device starts and stops automatically, changing programs over a twelve-hour period.

Once set, the device (christened the tuneomatic radio) provides for any combination of programs. It will even turn itself off at night and come back on the next morning to serve as an alarm clock.

It is believed that the apparatus will add to the pleasure and comfort of the radio by enabling a person to pick up a newspaper, select his entertainment for the evening and then forget about dialling for the rest of the time.

The first model shown by Mr. Kent resembles any large all-wave radio except that an electric clock is set in the

front panel. Around the edge of the clock's face are a series of small holes which serve as connecting channels between the time clock mechanism and the tuning circuit of the set.

The latter consists of sixteen outlets in the form of miniature telephone switchboards cords. There are two cords for each of seven stations so that fourteen different programs are provided for. Two extra cords serve for intermission periods.

When the cords are plugged into the holes corresponding to the selected program periods the radio operates automatically, shifting from station to station, program to program and starting and stopping all on schedule. If the self-tuning mechanism is not turned on the set operates like any other.

The device is expected to remove the bother of frequent tuning of the radio and the keeping track of time to make sure that a desired program will not be overlooked.

*Science News Letter, July 28, 1934*

## ZOOLOGY

**Whales Keep on the Move, Lest Water Enter Lungs**

**T**HE REASON why whales usually are seen bobbing up and down when they come to the surface of the sea for the purpose of breathing is because they can only breathe with safety when their blow-holes are at some height above the surface of the water. R. W. Gray of Exmouth, England, who has made a special study of the behavior of whales, writes to the British scientific periodical, *Nature*, that only exceptionally, when the sea is very smooth, as in the ice, can one see whales breathe while lying motionless at the surface.

Owing to their shape, writes Mr. Gray, whales usually can only bring their blow-holes into a favorable position for breathing by coming up to the surface obliquely at some speed; as they only get time to take a single breath, they have to repeat the performance again and again. The interval between the reappearances is very short, the animals diving only to a slight depth and progressing quite rapidly, usually in a straight line.

Narwhals are sometimes seen breathing while motionless, particularly in very fine weather. Unlike the whales, they are provided with a subcutaneous chamber connected with their single blow-hole, which may help to prevent water from reaching their lungs.

*Science News Letter, July 28, 1934*

**IN SCIENCE**

## ZOOLOGY

**Crying Baby Bear Sounds Like Human**

**R**ANGER Ben C. Miller of the Walton District in Glacier National Park was all set to be a hero when he heard anguished cries coming across Ole Creek as he passed along a nearby trail. After using his binoculars in an effort to locate the person in distress, he was just starting over to investigate fully when the cause of the cry appeared in the open.

An old mother bear came up the trail, accompanied by her two cubs. One was twice as big as the other and could keep up with the mother. The little one was tagging along about fifty feet behind, and every ten feet or so he would emit a tremendous squall, evidently an appeal in bear language for her to slow up.

Even after Ranger Miller discovered the source of the tragic sounds he contends that they sounded like the cries of a person in great pain calling for help. He adds: "Although I'm not real sure, through the glasses it looked to me as if tears as big as baseballs were rolling down his cheeks."

*Science News Letter, July 28, 1934*

## PHYSICS

**Institute Murals Will Shine in Ultraviolet**

**A** GROUP of invisible mural paintings, that cannot be seen until invisible light is turned on them, are now nearing completion in the Franklin Institute Museum, Philadelphia. Charles Bittinger of Washington, D. C., and Duxbury, Mass., is the artist.

When the exhibit is finished, the visitor will enter a small room with apparently plain white walls, and a mantlepiece and empty fireplace at one end. As the white light is extinguished and invisible ultraviolet light is turned on, three paintings in full color will appear.

This will be done by the use of fluorescent pigments.

*Science News Letter, July 28, 1934*

# NCE FIELDS

## PALEONTOLOGY

### Rare Dinosaur Tracks Found in Pennsylvania

**W**HERE a dinosaur once trod in Pennsylvania has come to light through blasting for road construction by the Pennsylvania State Highway Department and the observation of Dr. Bradford Willard of the Pennsylvania Topographic and Geologic Survey.

A single dinosaur track in a thin slab of dark red shale of Triassic age was found by Dr. Willard among tons of rock shot down in widening U. S. Highway 111 near New Cumberland. Mud cracks, rain drop impressions and what seem to be impressions of plant stems were found on the same slab.

Last year two other dinosaur tracks were found near Yocumtown, Pa., and one track was found near Gettysburg, Pa. These fossil track discoveries show that dinosaurs lived about 150,000,000 years ago in what is now Pennsylvania.

Dr. Willard has reported his discovery to the scientific journal, *Science*, in the hope that others may watch for similar fossils.

*Science News Letter, July 28, 1934*

## ARCHAEOLOGY

### Cloudbursts Rip Mountain And Reveal Huge Rain God

**T**HREE cloudbursts that ripped the earth from the side of a mountain in the state of Morelos have uncovered a huge carving of the Indian rain god himself in his heavenly home.

Hearing this report from Indians of the region, Senorita Eulalia Guzman, archaeologist at the Mexican National Museum, set off to investigate, and found the story apparently true.

The huge carving of the rain god is nearly 14 feet high and 15 feet wide. It shows a youthful godlike being with garments sprinkled with alternate flowers and raindrops. He sits in a triple vaulted hollow in the sky. Out of this symbolical cave in heaven roll great spirals which may represent loud voices such as those of thunder. From three

banks of cloud overhead come lines of descending rain. Beneath is an alternating pattern of conventionalized raindrops and hieroglyphs standing for "turquoise" or "precious substance."

The carving is part of an archaeological city not heretofore known to scientists. Although the region is Aztec-speaking now, the ancestors of these Indians did not make the carving, for it is in the different art style of Maya-Toltec civilization.

*Science News Letter, July 28, 1934*

## GENERAL SCIENCE

### More Than 7,500 German Intellectuals Are Refugees

**S**OME 7,500 academic and professional refugees from Nazi Germany are now attempting to create a new existence for themselves in foreign countries, the Emergency Committee in Aid of Displaced German Scholars revealed in summarizing international attempts at rescue. It is declared that "of all classes affected by the National-Socialist revolution in Germany the academic and the professionals have suffered the most."

A High Commission for Refugees Coming from Germany is coordinating the work in various countries. Sixty German scholars have been placed in American institutions of higher learning. More than 1,300 German scholars have been displaced, of whom 600 to 700 have or will shortly emigrate. Between 5,200 to 5,500 professional people have left Germany and 1,500 to 1,600 of the 7,000 German university students forced to quit their studies have sought refuge outside Germany.

*Science News Letter, July 28, 1934*

## ASTRONOMY

### Antarctic Meteor Display Not So Large as October's

**C**OMPARED with usual meteor showers, the display of "shooting stars" on the night of July 12 at 300 per hour reported by radio from Little America, Antarctica, by Dr. Thomas C. Poulter, was remarkable. It did not equal the great shower of October 9 of last year seen from Europe. Then 200 meteors were seen in two minutes by one observer and then the flashes appeared so fast that counting became impossible. Five hundred meteors per minute were seen by another observer.

*Science News Letter, July 28, 1934*

## CHEMISTRY

### New Fadeless Dyes Are Sought By Spectroscopy

**N**EW DYES, resistant to fading by light and washing are being developed by studies of the colors which they absorb when light is passed through them, Prof. Wallace R. Brode of Ohio State University revealed before the Second International Spectroscopy Conference recently held at Massachusetts Institute of Technology.

By analysing the light absorption of dyes, Prof. Brode is investigating the causes which make dyes decompose. "Apparently it is a photo-chemical reaction," he said.

"We hope to be able to predict from the absorption spectrum of a dye its exact structure. Then we should be able to synthesize dyes and make exactly what we wish," he added.

*Science News Letter, July 28, 1934*

## ETHNOLOGY

### Persia Yields Clues To Cradle of Race

**T**HE LONG sought-for original home of the Indo-European race may have been found through discoveries in Persia by the well-known Swedish archaeologist, Dr. Ture Arne who has returned to Stockholm.

Dr. Arne made extensive excavations at the foot of the Elbrus mountains of Persia, at the Caspian Sea. In an ancient mount at Shah-tepe he found numerous remains of a 5000-year-old town which, probably by a catastrophe or some climatic change, ceased to exist about 2000 B. C.

The town belonged to the Copper age, finely wrought articles of copper such as statuettes, daggers, trinkets, and lamps, having been found by the Swedish expedition. The bulk of the relics, however, consist of beautifully made ceramics painted in bright colors.

About 40 skeletons have been brought back by Dr. Arne. The shape of the craniums of these early inhabitants indicates that they belonged to the earliest Indo-European family.

Human sacrifice evidently was part of the religious rites of the natives of Shah-tepe, and it is thought possible that these discoveries and future excavations in the same district may solve important prehistoric problems.

*Science News Letter, July 28, 1934*

MEDICINE

# How a Tall Man Grew Short

The Hormone From His Parathyroid Glands Was the Evil Potion That Made Captain Martell Lose 12 Inches

By JANE STAFFORD

**S**UPPOSE you found yourself shrinking, not in an awful dream but in real life. Suppose you grew twelve inches shorter. This does happen. It happened to Captain Charles Martell, valiant young sea captain.

He was master mariner in the merchant marine and when only 22 he was navigating transports through the war zone. If you had seen him then you would have been impressed by his size and powerful physique. But this husky, healthy man of six feet one began to shrink. He had pains in his legs and back and his muscles grew weaker. He stumbled often, fell over a chair and broke his arm. His fellow-officers poked fun at him because he was becoming pigeon-breasted.

He suffered from a rare and strange malady called hyperparathyroidism. It is a disease of the parathyroid glands. There are four of these in the human body, each about the size of a pea. They are located in the neck, as a general thing lying in pairs on the inner side and toward the back of each lobe of the thyroid gland. Tiny as they are, they exert a tremendous influence on the body, particularly on the bones.

## Removal Fatal

Because they are so insignificant-looking and so closely attached to the thyroid gland, sometimes buried in it, physicians used to think they were just part of that gland. But when they were removed with the thyroid gland, in operations to relieve Graves' disease and goiter, dire things happened to the luckless patients. Agonizing muscular cramps and convulsions seized them and they died a death not unlike the horrible death of lockjaw or tetanus. From this similarity, the condition got its name of parathyroid tetany.

This condition results when the parathyroid glands are removed or when through injury or disease they fail to produce enough of the hormone by which they exert their influence on the body. Captain Martell suffered from just the opposite condition. His para-

thyroid glands became overactive and produced too much hormone.

This is a very unusual happening. It occurs so rarely, in fact, that before the case of Captain Charles Martell physicians and medical scientists generally knew very little about the condition or what caused it. But his unusual cooperation and courage enabled a group of doctors in New York and Boston to study this strange disease and learn all about it. Now they know what causes it, how it affects the bones, the blood and the rest of the body.

## Pain Like Arthritis

Among the early symptoms of the ailment are rheumatic pains in the muscles and joints. Captain Martell suffered from these, all the time he was growing shorter and being teased because of his pigeon-breast. He persisted in his duties at sea even after the pain and muscle weakness made it difficult for him to climb stairs and ladders, until abdominal pain and vomiting forced him to seek medical aid. When he finally went to the marine hospital, the rheumatic pains led the physicians to diagnose his ailment as arthritis. You could hardly blame them for missing the true nature of his malady. Hyperparathyroidism is not encountered in the general run of marine hospital practice, or other medical practice, for that matter.

So for one year he was treated for arthritis. But he did not improve. At this time his height had decreased from six feet one to five feet eight and one-half inches. His neck had shortened and thickened so that he had to wear larger collars. It was at the end of the year's treatment that he stumbled over a chair, breaking both bones of his left forearm.

An X-ray picture taken at this time showed that his bones were less dense than normal, which suggested that he was suffering from the bone disease, osteomalacia. For the next two years he remained in the Marine Hospital at Staten Island. His broken arm had to stay in a cast for nine months before the bones knit. During the two years



CAPTAIN CHARLES MARTELL

## NOT A PHYSICIAN

The man responsible for the present knowledge of the rare disease hyperparathyroidism was not a physician. Nevertheless, he deserves a prominent place among the pioneers of medicine. Captain Martell's dauntless courage and his desire to add to medical knowledge caused him to submit to the surgeon's knife repeatedly, that others might be saved from his painful death.

he suffered two additional fractures of his arms.

For four months at a time he lay stretched on a frame, trying to gain back some of the lost inches. The stretching apparently added half an inch to his height, bringing it up to five feet nine inches while he was lying in bed. However, when he was measured

after standing erect for half an hour, his height was only five feet six inches. Then he wore a supporting body brace.

At this time his neck had shortened, his head was sinking and his lower jaw had become deformed, protruding forward so that his teeth were out of alignment. X-ray pictures showed that the one disease now involved all the bones in his body. He was put on diets containing large amounts of foods rich in the bone-building elements, calcium and phosphorus. Medicines containing these minerals, and in addition cod liver oil, thyroid extracts, adrenalin, light rays, quartz lamp treatment, and milk irradiated to increase its vitamin D content were tried. But he showed no improvement and almost all the time he was in the hospital he suffered from weakness and nearly constant pain in his bones and joints.

#### Transferred to Bellevue

After it became evident that he was suffering from a disease of the bones, he was transferred to Bellevue Hospital, where scientists of the Russell Sage Institute of Pathology, Drs. R. R. Hannon, E. Shorr, W. S. McClellan and E.

F. DuBois, began investigations of the chemistry of his body, which apparently had somehow become disordered. They observed changes in his blood chemistry and excretions similar to those previously observed in dogs when an active parathyroid gland extract was administered. This suggested to Dr. DuBois that the Captain was probably ill because of an excessive secretion of his parathyroid glands. When the Institute, a part of Cornell University, closed its laboratories for the summer, Captain Martell was sent to Massachusetts General Hospital in Boston where Harvard Medical School scientists, Drs. Joseph C. Aub, Walter Bauer, Fuller Albright, and Charles L. Short continued the investigations. They confirmed the findings observed by Dr. DuBois and his coworkers.

What had happened to weaken the young captain's bones so that they could no longer support the weight of his body but bent under the load until they were deformed? You probably think that after you have grown up and your bones have reached their adult size they normally undergo no further change. But medical scientists now consider bone an active tissue, something like skin and muscle, that is constantly being built up and broken down. Bone diseases, such as rickets and osteomalacia, are conditions in which the building-up process is faulty. The new tissues, instead of being normal bone, are deficient in lime salts. Lime or calcium is one of the elements that give bones their hardness.

#### Usually Caused By Diet

This condition may result from several causes. Malnutrition and lack of certain dietary factors such as vitamin D and calcium is one cause, resulting in rickets in children. Another cause is repeated bearing and nursing of children which may divert the calcium from the mother's system to her child's, leaving her with diseased and weakened bones. A third cause is disturbance of the glands of internal secretion, particularly the parathyroid glands.

Much of this knowledge about bone diseases and their causes was gained from investigations and experiments performed on dogs, guinea pigs and other laboratory animals. Captain Martell did not hesitate to join the ranks of experimental animals, letting the doctors treat him, operate on him and make test after test. When they wanted to stop after four operations, he threatened to leave the hospital and find another

where the proposed operations would be carried out. He fought his rare disease as he would pilot a disabled ship through a stormy sea, insisting that the doctors carry on their investigations, not so much to save himself as to add to medical knowledge.

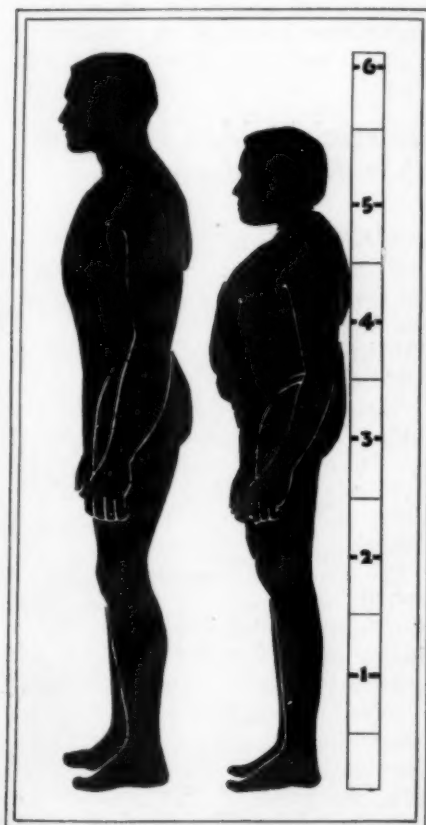
But the dogs and guinea pigs and other non-human laboratory animals had done their part, too. Working with them, a Canadian investigator, Dr. J. B. Collip of McGill University, extracted the potent hormone of the parathyroid gland which he called parathormone. Parathormone, he found, relieved the agonizing cramps and convulsions of parathyroid tetany and saved the lives of animals after their parathyroids had been removed. Of course, if every scrap of parathyroid was cut out, doses of parathormone had to be repeated indefinitely to keep the animals alive.

#### Too Much is Bad

Dr. Collip then gave doses of parathormone to normal animals. Bone deformities, weakness of muscles, finally of the whole body, and brittleness of bones were among the symptoms that followed. Tests of blood and excretions indicated that more calcium was being lost than was being taken in by the animal. Consequently the new bone tissue being formed lacked the necessary lime salts to harden it, and the bones became thinner because lime salts were being excreted at so rapid a rate.

Tests and observations of Captain Martell showed that he had the same symptoms as these laboratory animals that were getting excessive amounts of parathormone. For a short time the Boston physicians gave Captain Martell parathormone. The effect was to increase the severity of his pain and other symptoms.

By this time, Dr. Bauer and his associates were convinced that their patient was suffering from overactive parathyroid glands, probably as the result of a parathyroid tumor. So they decided to remove by surgical operation the parathyroid tumor, if they should find one. At the first two operations one parathyroid gland was removed from each side. Examination of these glands showed them to be entirely normal. So two more operations were performed, the surgeon searching the right and left sides of the thyroid for a possible tumor, and even removing one lobe of this gland. There was no improvement in Captain Martell's condition as a result of these operations, and



EFFECTS OF DISEASE

These silhouettes show how hyperparathyroidism distorts the body.

by this time his physicians thought he had stood enough. With undaunted valor the young captain insisted that they go on. At his request three more operations were performed. At the fifth the surgeons searched the upper left neck region and at the sixth the upper right neck region.

Finally, at the seventh operation, the surgeons explored the upper middle part of the chest in front, known medically as the anterior mediastinum. There they found the tumor and removed it. So far as known, this is the first parathyroid tumor found in this location and successfully removed.

In describing this last operation, Dr. Bauer said:

"At this point we all felt that the Captain had had a sufficient number of operations, that his general condition was anything but good and that we were not justified in proceeding further. However, the Captain insisted that his mediastinum should be operated to see whether or not the tumor was present. He said that if it was not done at the Massachusetts General Hospital, he would have it done elsewhere. His requesting this operation meant that the first anterior mediastinotomy was done in searching for a parathyroid tumor and that the search was successful."

### Too Late to Save Him

It was too late to save the brave captain. He lost his last fight, dying at the age of 36. But the knowledge gained through his rare courage has already enabled the physicians to find a similar tumor in a similar location in another patient. This patient had previously undergone two unsuccessful operations.

"Had it not been for our experience with Captain Charles Martell," Dr. Bauer commented, "this patient might have gone along for some years longer without the tumor being removed."

From their study of Captain Martell, the physicians have learned as much about this disease as they ordinarily would have from a dozen cases of the same disease, Dr. Bauer added. They now have complete knowledge of the symptoms and signs and chemical findings. As a result, he hopes that physicians throughout the world will realize that hyperparathyroidism is a distinct disease and that it is not even such a rare malady as has been supposed.

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Science News Letter, July 28, 1934

#### BACTERIOLOGY

## Bacteriophage Is On Border Between Chemical and Life

**B**ACTERIOPHAGE, strange substance that preys on disease "germs" and destroys them, has become fairly well-known since the days when the French-Canadian scientist, Dr. F. d'Herelle, described it. Hopes ran high in the early days that the "germ-eater" would prove a true panacea for most if not all of the infectious diseases that plague mankind.

Popular accounts stressed this phase of the new substance. Less well-known is the hope held by scientists that study of the nature of bacteriophage may contribute to an understanding of the great mystery of life.

How knowledge of bacteriophage might answer or partially answer the question, What is life? is explained by Alice C. Evans of the U. S. National Institute of Health in Washington. Reporting some of her own investigations of bacteriophage to the journal, *Science*, Miss Evans takes occasion to point out the following:

"The study of bacteriophage promises to enlighten the philosophical consideration because it stands at the border line between catalytic chemical substances, on the one hand, and living matter, on the other.

"If bacteriophage be regarded as an enzyme it must be conceded that it is endowed with at least one of the attributes of living matter—a limited ability for adaptation to its environment.

"On the other hand, the minute size of the individual particles offers an ob-

stacle to the acceptance of the idea that they may be living organisms. It has been shown that they may be no larger than certain protein molecules. They are so small that ten or even a hundred billion individuals may exist in a cubic centimeter of broth which nevertheless remains as clear as crystal."

A cubic centimeter is about twenty drops of fluid.

Miss Evans' investigations were of a bacteriological nature and were concerned with bacteriophage that could destroy various kinds of streptococci, the organisms that cause such ailments as septic sore throat and scarlet fever. She found that sensitivity or resistance to several races of bacteriophage might be a means of identifying certain kinds of streptococci. Her studies also showed that, contrary to common belief, streptococcus bacteriophage is widely distributed, at least during the season when streptococcus infections are prevalent.

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#### PHYSIOLOGY

## Overweight Men Healthier Than Are Underweights

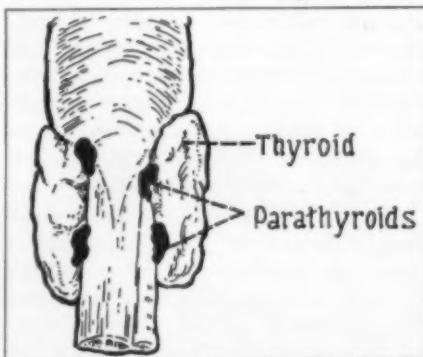
**O**VERWEIGHT young men have more physical endurance, greater resistance to infectious diseases, and are less likely to develop nervous or mental disorders than young men who are underweight.

These conclusions are drawn from a study of accepted entrants to the Royal Air Force and are reported by Dr. H. A. Treadgold, Group Captain, Royal Air Force, to *The Lancet*, British medical journal.

Dr. Treadgold compared the men's weights when they entered the Royal Air Force with their accomplishments in athletic competition and records of sick leave and invaliding from the Service.

"There is a definite relationship between varying degrees of body-build and functional efficiency, whether viewed from the points of capacity to endure severe or prolonged physical or mental stress or resistance to disease generally," he found.

"Capacity to endure severe or pro-



### POWERFUL GLANDS

The tiny parathyroid glands, about the size of peas and located in the neck, have a tremendous influence on the body, particularly the bones.

longed physical stress as evidenced by athletic prowess is found most commonly among the over-weights. An exception to this is seen in long-distance athletes among whom underweight is commoner than overweight.

"The greater the degree of under-

weight on entry, the greater the likelihood of invaliding from the Service on medical grounds.

"It is uncommon for overweight individuals to become underweight and vice-versa."

*Science News Letter, July 28, 1934*

#### MEDICINE

## License Granted To Make New Arthritis Vaccine

A NEW kind of vaccine for the treatment of the kind of rheumatism which physicians call "chronic infectious arthritis" has been developed by Drs. Bernard Langdon Wyatt and Robert Alan Hicks of Tucson, Ariz., in the course of more than two years' investigations.

The vaccine is of a special type and is made from microorganisms belonging to the streptococci group. It is given by injection into the veins in selected cases of chronic infectious arthritis.

While great benefits have been reported by a considerable number of physicians throughout the country, Drs. Wyatt and Hicks state that it is not to be regarded as a cure-all and that patients should be selected for this treatment in the manner described by them.

The Wyatt Clinic Research Laboratories have been licensed by the United States Government to manufacture the vaccine. This does not mean that the federal government guarantees the safety or effectiveness of the vaccine. It does mean, however, that so far as the government can control the conditions surrounding its manufacture and distribution, the vaccine is safe and will produce the results claimed for it in treating the disease.

### Must Be Licensed

Biological products of this type, vaccines and serums for prevention or treatment of disease, may be sold in interstate commerce only when licensed by the Secretary of the Treasury. The licenses are issued on the recommendation of the National Institute of Health of the U. S. Public Health Service.

Among the regulations which must be met before a license is issued are the following: The product must be manufactured in suitable physical surroundings, that is in a room by itself and

separate from rooms or laboratories where diagnostic tests are being made; the manufacturing laboratory must be in charge of a competent professional staff; and the product must be safe and effective, so far as can be told.

*Science News Letter, July 28, 1934*

#### MEDICINE

## Spectroscope Used To Detect Lead in Body

LEAD may be detected in the human body in a tenth the usual time for such a test by means of the spectroscope, it appears from reports of Prof. J. Stuart Foster of McGill University, Montreal, and Prof. Jacob Cholak of the University of Cincinnati at the Second International Spectroscopy Conference held at Massachusetts Institute of Technology.

While qualitative determination has been possible for some time, exact quantitative measurement has been exceptional without the use of the spectroscope. Both scientists also pointed out that chemical analysis heretofore used requires anywhere from 10 to 14 days while the spectroscopic analysis is possible in a period varying from 24 to 48 hours. This method also requires less tissue for the test.

Prof. Foster explained that the tests are made by a comparison of the intensity of the lead spectra with that of magnesium in the same sample being tested, in this case, an amount of spinal fluid. Using known lead concentrations to add to the spinal fluid and establishing a relation between the above ratio and the lead concentration, it is possible to detect one hundred millionth gram of lead per cubic centimeter.

Prof. Foster hopes to apply this method to the study of lead as a possible cause of multiple sclerosis.

*Science News Letter, July 28, 1934*



### Of Dragons

WE LIKE to identify creatures from the scary fairy-tales of our childhood, or of the race's childhood, with actual living monsters, even though we meet them when we are grown-ups!

Thus with dragons. When the zoological gardens in Washington and New York acquired some new giant lizards from Komodo recently, nothing would do but they must be dubbed "dragon-lizards." These fearsome firebreathing monsters that rumbled and puffed through the folk-myths of the whole world from the legend of St. George to the tales of ancient China, were more real in our still-childlike imaginations than the almost unknown flesh-and-blood beasts crawling in the jungles of an almost unknown East Indian island. We had always had a shadow of a dragon lying across our path, and we were delighted to find a creature to fit it, even though it was really hardly big enough.

Unimportant, that the real dragons are very rare. So were the dragons of mythical antiquity. Not every cave or forest could boast one, nor every maiden be menaced by one, nor every stout young man slay one. You had to live very far away, and be a princess, and your rescuer had to be either the son of a king or the son of a god.

And in some parts of the world there were good confirmations of the one-time existence of dragons. In China especially could plenty of dragon's bones be found—fossils of the long-gone dinosaurs, that washed out of the weathering soft rocks as rivers ate away at their banks. The Chinese were scientists enough to recognize them as bones; poets enough to clothe those bones with terrifically fearsome flesh. Some bird and mammal entered into

the composition of the Chinese dragon, but the great bulk of him—and it was a really great bulk—remained (quite properly) reptilian.

It is even reported that tons of stony dinosaur fossils have been swallowed by centuries of generations of ailing Chinese, ground up into powder and mixed with wine, to restore strength and youth and make the world seem all right again. Well—Chinese wine is said to be potent!

Probably if the naive Chinese medical men could have had access to later Occidental scientific investigations, they would not have been so eager to prescribe dragons' bones so indiscriminately. For by no means all the dinosaurs were fierce and aggressive, if modern judgments are at all correct. Many of them, and practically all of the biggest, like the giant Brontosaurus for example, were probably as placid as cows, and much more stupid. Their teeth prove that they were vegetarians, and their skull-cavities allow space for a brain hardly larger than a teacup—and that to run an animal bigger than a house!

No, the Celestial physicians, if they were prescribing today, would without question insist on authentic Tyrannosaurus bones for strength and fierceness, or Thalattosaurus bones for skill in sea-faring, or the bones of the flying Pterodactyl for lightness and lifting up of the heart.

*Science News Letter, July 28, 1934*

Rare and famous dinosaur skeletons in the Royal Museum of Natural History in Brussels are beginning to deteriorate from the moisture in the air, and will be lost to science unless removed to glass enclosures.

#### MEDICINE

## Death Predicted by Means of Spectroscopic Test of Blood

### Patients In Extremis Are Subject to Profound Chemical Changes Affecting Color Elements in Blood

**F**ORECASTING death by means of spectroscopic investigation of the blood of ailing patients was reported at the second annual International Spectroscopy Conference in session at the Massachusetts Institute of Technology.

In several cases physicians attending the patients were of the opinion that death was imminent, it is reported, and were amazed to find the spectroscopic prediction verified within as small a time as 24 hours.

The report was made by P. and L. Lecompte de Nouy, two French scientists associated with the Pasteur Institute, who did not attend, but communicated their report to Prof. George R. Harrison of the Massachusetts Institute of Technology, chairman of the conference, who delivered it in their absence.

Analyzing over 8,000 samples of the blood of men, horses, and sheep, these scientists have found that curves plotted by a spectroscopic examination of the serum and white plasma of the blood show remarkable constancy, "so great that they can be really superimposed on each other."

When departures from this general curve are noted, it is stated, it can be safely interpreted as an indication of pathological disturbances. Such altera-

tions are rare and seem to correspond to fatal cases.

"Alterations in the curves," reads the report, "must correspond to very deep chemical modifications affecting the chromophoric (color) elements which belong to very stable chemical groups."

"We predicted a man's death, which followed in 24 hours. He was partly paralyzed, owing to a malignant tumor of the spine, with metastases in the lower jaw, and urinary infection. He was expected to live, however, for many months."

*Science News Letter, July 28, 1934*

#### PHYSICS

## Explosion Sound Bears News of Stratosphere

**E**XPLORING the stratosphere by means of explosions set off on the earth's surface is one of science's new methods of gaining information about this mysterious region without leaving the ground.

The experiments are described by Dr. Kurt Wolcken of the University of Goettingen in the Berlin scientific journal *Forschungen und Fortschritte*.

It has often been observed, Dr. Wolcken writes, that a great explosion can only be heard within a radius of 80 to 100 miles. Beyond this limit there is a ring of silence, and then another zone, where the sound can again be heard. There is a skip zone for the sound just as there is for short radio waves.

Two theories have been proposed to explain the phenomenon. One is that the effect is due to the increase in wind velocity which occurs with the height. Sound is more often heard to the east in winter and to the west in summer, and other correlations with wind velocity and direction have been noted.

Another theory is that the effect is due to a rise in temperature in the upper stratosphere but there is no experimental evidence in its support. Sounding balloons have seldom risen above 20 miles (the record is 22 miles). They

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have shown that the temperature diminishes to about minus 67-degrees Fahrenheit at a height of 8 miles and then remains sensibly constant up to the greatest heights reached. Moreover, it is difficult to see why there should be a rise in temperature at greater heights, unless the upper layers of the stratosphere are more strongly heated by the sun's rays.

To test this temperature theory, experiments were made in the polar regions during the polar night 1932-33. Twenty-eight explosions were set off, using 13,500 pounds of explosives. The return sound was heard despite the fact that the sun's rays had not reached the air at a height of 65 miles for six weeks. The delay in the sound was about the same as in middle Europe, so that the sound must again have reached this height before returning earthward.

The conclusion drawn was that if there is a rise in temperature in the upper stratosphere, it cannot be due to the sun's rays. It might be due to the cosmic rays or to the ozone layer.

*Science News Letter, July 28, 1934*



A HIGHWAY MODEL

*This model of a highway is very lifelike even to the pedestrian and the dog. It is built to a scale of one-eighth, its 240-foot length representing a 2,000-foot stretch of highway. The purpose of the model is the comparison of tungsten-filament illumination with the more recently developed sodium-vapor and mercury-vapor lamps as sources of light in research conducted by the General Electric Company.*

ASTRONOMY • METALLURGY

## Scratch-Proof Mirrors Made for Telescopes

A NEW improvement in the coating of mirrors for astronomical use with aluminum wherein a hard, tenacious, nontarnishing and highly-reflecting surface is attained is reported by Robley C. Williams of the physics department of Cornell University in a letter to the Editor of the *Physical Review*.

Carefully cleaned mirrors are coated with chromium by evaporating the metal on the glass surface. Onto the thin chromium layer is evaporated a film of aluminum sufficient to produce an opaque layer. When washed with alcohol and water such laminated films have remarkable properties, Mr. Williams reports.

Rubbing the film with a blunt steel instrument or even steel wool affects the layer only slightly. Rubbing the film with cheesecloth as hard as possible by hand reduced but little the reflecting power of the layer. Even when kerosene soot containing sand and grit was placed on the film and then cleaned off with alcohol and water 20 successive times only slight surface scratches were

observed. The same test for a hardened aluminum film alone showed comparable scratching with only four washings. So tenacious is the layer that several kinds of adhesive tape attached on the film may be ripped off without bringing the film away also.

The film of chromium and aluminum, reports the Cornell scientists, is essentially an aluminum film as far as mirror optics are concerned for the aluminum is evaporated on thickly so that it alone causes reflection. The backing layer of chromium is employed to gain the properties of adhesiveness and hardness.

The Cornell work is the latest in the rapidly expanding field of covering mirrors for astronomical and other scientific work with coatings of aluminum having superior properties of reflection in certain portions of the spectrum.

Engaged in this field of research are three groups of workers; the Cornell University group including S. L. Boothroyd, H. C. Ketcham, R. C. Williams, and G. H. Sabine; the California Institute of Technology group including Dr.

John Strong and Dr. C. H. Cartwright and the University of California at Los Angeles group headed by Dr. H. W. Edwards.

The largest mirror so far coated with aluminum is the 36-inch diameter Crossley reflector at the Lick Observatory of the University of California, which was coated by Dr. Strong. While no predictions are being made it is hoped that the process will be sufficiently well developed so that by the time the great 200-inch mirror now being built for California Institute of Technology is complete, it too may be given a coating of aluminum.

*Science News Letter, July 28, 1934*

## HUNTING EARTHQUAKES

an address by

Rev. Joseph Lynch, S. J.

Professor of Physics and  
Director of the Seismic Ob-  
servatory, Fordham Univer-  
sity

Wednesday, Aug. 1, at 3:30  
p. m., Eastern Standard  
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scientist speaks over the  
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# ●First Glances at New Books

## Psychology

**INTRODUCTION TO PHYSIOLOGICAL PSYCHOLOGY**—Graydon LaVerne Freeman—*Ronald Press*, 379 p., \$4.50. A textbook intended not alone for the psychology student but for those interested in medicine, education, sociology, and zoology as well. Physiological psychology, the author says, does more than collect relevant material from physiology and neurology and relate it to psychological problems; it is actively engaged in building up a scientific literature dealing with the physiology of the intact human organism.

*Science News Letter, July 28, 1934*

## Psychology

**INTRODUCTION TO COMPARATIVE PSYCHOLOGY**—Carl J. Warden, Thomas N. Jenkins, and Lucien H. Warner—*Ronald Press*, 581 p., \$4.50. An abridgement by the senior author of an exhaustive study made by all three, of the immense and widely scattered literature on the subject of plant and animal behavior. Long reference bibliographies have been replaced by short lists for reading, the use of technical terms has been reduced, and in general the work has been made suitable for use as a text by the average student and as a reference work by the layman.

*Science News Letter, July 28, 1934*

## Physics

**SIR ISAAC NEWTON'S MATHEMATICAL PRINCIPLES OF NATURAL PHILOSOPHY AND HIS SYSTEM OF THE WORLD**—Florian Cajori—*Univ. of California Press*, 680 p., \$10. Revision of Andrew Motte's 1729 translation into English from the Latin of Sir Isaac Newton's famous book on the mathematical principles of natural philosophy. The author, late professor emeritus of the history of mathematics at the University of California, devoted years to this long-awaited work.

*Science News Letter, July 28, 1934*

## Psychology

**A NEW PHYSIOLOGICAL PSYCHOLOGY**—W. Burrige—*Wm. Wood and Co.*, 158 p., \$3. In which the author, a professor of physiology at Lucknow University, England, "develops the theory that the central neurones and sensory end-organs are rhythmically acting colloidal systems with two sources of energy, viz. absorption reactions and changes of colloidal aggregation. The proportions between the two sources are

capable of infinite variation and their interaction provokes response. The data of a sensation or idea are mediated through the first, and consciousness through the second source in the organ of the mind." His theory is a development of a prolonged experimental study of the heart. If the reader has doubts, the author recommends that he too conduct such an experimental study.

*Science News Letter, July 28, 1934*

## Criminology

**TWENTIETH CENTURY CRIME: EIGHTEENTH CENTURY METHODS OF CONTROL**—James Edward Hagerty—*Stratford*, 222 p., \$2. A book not about crime at all. It is a succinct survey of American methods of administering justice. Three sections deal respectively with legal procedure, treatment of the convicted, and penal systems.

*Science News Letter, July 28, 1934*

## Psychology

**PRACTICAL PSYCHOLOGY IN CHARACTER DEVELOPMENT**—Vera Barclay—*Sheed and Ward*, 190 p., \$2. Selections from "The Psychology of Character" by Rudolf Allers who is a reader in psychiatry at the University of Vienna.

*Science News Letter, July 28, 1934*

## Psychology

**INDIVIDUAL DIFFERENCES**—Frank S. Freeman—*Henry Holt*, 355 p., \$2.50. The subtle and wide differences between the minds of men are due to manifold causes in the heredity of the person and in the environment. This volume surveys the influences of inheritance, environment, race and nationality, sex, age, and special abilities and traits of personality.

*Science News Letter, July 28, 1934*

## Education

**A SOCIAL BASIS OF EDUCATION**—Harold S. Tuttle—*Crowell*, 589 p., \$3. The author's thesis is that society's stake in the attitudes which a child acquires is even greater than in the skills and concepts he gains, and that education can serve its social purpose only by consciously cultivating social interests.

*Science News Letter, July 28, 1934*

## Aeronautics

**EXPLORING THE UPPER ATMOSPHERE**—Dorothy Fisk—*Oxford*, 166 p., \$1.75. This is "the first book in any language about the stratosphere." Balloon ascensions are only one small way of probing the secrets of the stratosphere by which man taps its "floor" ten miles above the earth. There are 130 miles more to go. The author explains for the layman how science explores the region.

*Science News Letter, July 28, 1934*

## Ethnology

**A NEW ORIGINAL VERSION OF BOSCAN'S HISTORICAL ACCOUNT OF THE SAN JUAN CAPISTRANO INDIANS OF SOUTHERN CALIFORNIA**—John P. Harrington—*Smithsonian Inst.*, 62 p., 2 pl. 5c. Early in the nineteenth century, Fr. Jeronimo Boscana worked among California Indians and wrote a treatise on their aboriginal life. This valuable old manuscript disappeared, and has been known only through a rather inadequate English translation. Now Mr. Harrington has discovered, not the 1846 original of this known translation, but a variant version written earlier, in 1822. The monograph contains Mr. Harrington's translation.

*Science News Letter, July 28, 1934*

## Psychology

**COMPARATIVE PSYCHOLOGY**—Edward L. Thorndike and others—*Prentice-Hall*, 529 p., \$3.50. This text was planned by a small group interested in the subject who got together at a recent meeting of the American Psychological Association. A committee selected, from suggested outlines, the topics to be included and assigned each of them to a specialist in the respective field. Bibliographies are unusually comprehensive.

*Science News Letter, July 28, 1934*

## Hygiene

**HEALTH IN HOME, SCHOOL AND COMMUNITY**—Lucy S. Morgan and Fay Morgan—*Patteran Press*, 55 p., 50c. This is a practical guide for parent-teacher and women's associations to follow in a program of health study and promotion.

*Science News Letter, July 28, 1934*

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